Self-reported health care seeking behavior in rural Ethiopia: Evidence from clinical vignettes

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Abstract

Between 2000 and 2011, Ethiopia rapidly expanded its health-care infrastructure recording an 18-fold increase in the number of health posts and a 7-fold increase in the number of health centers. However, annual per capita outpatient utilization has increased only marginally. The extent to which individuals forego necessary health care, especially why and who foregoes care are issues that have received little attention in the context of low-income countries. This paper uses five clinical vignettes covering a range of context-specific child and adult-related diseases to explore the health-seeking behavior of rural Ethiopian households. We find almost universal preference for modern care. There is a systematic relationship between socioeconomic status and choice of providers mainly for adult-related conditions with households in higher consumption quintiles more likely to seek care in health centers, private/NGO clinics as opposed to health posts. Similarly, delays in care-seeking behavior are apparent mainly for adult-related conditions. The differences in care seeking behavior between adult and child related conditions may be attributed to the recent spread of health posts which have focused on raising awareness of maternal and child health. Overall, the analysis suggests that the lack of health-care utilization is not driven by the inability to recognize health problems or due to a low perceived need for modern care but due to other factors.

Keywords

Self-reported health care seeking behavior in rural Ethiopia[1]
Evidence from clinical vignettes

1   Introduction

Over the past decade, Ethiopia has recorded notable progress in a number of population health outcomes. For instance child mortality per 1000 live births has fallen from 166 in 2000 to 88 in 2011 and maternal mortality rates have declined from 871 to 676 per 100,000 live births (see Table 1 for details).

TABLE 1
Selected health indicators

Heath indicator	Year of the survey		
	2000	2005	2011
Under five child mortality rate (per 1,000 live Births)	166	123	88
Under five child diarrhea:			
Prevalence sometime in the two weeks before the survey (in percent)	24	18	13.4
Percentage of these for whom treatment was sought from a health facility	13	22	31.8
Under five child acute respiratory infections (ARI):			
Prevalence at some time in the two weeks before the survey (in percent)	24.4	13.8	7
Percentage of these for whom treatment was sought from a health facility	15.8	21	27
Maternal mortality ratio per 100,000 live births in the last five years preceding the survey	871	673	676
Mothers who received at least one antenatal care visit for birth in the last five years preceding the survey (in percent)	26.7	28.1	42.4
Deliveries attended by skilled health professionals in the last five years preceding the survey (in percent)	5.6	5.7	10

Source: 2000, 2005, and 2011 Ethiopian Demographic and Health Surveys.

These changes have been accompanied by a rapid expansion of health-care infrastructure at all levels. According to Ethiopia's Federal Ministry of Health (see Table 2 for details), there has been an 18-fold increase in the number of health posts from 833 in 2000 to 15,095 in 2011 and a 7-fold increase (356 to 2,660) in the number of health centers over the same period. Consequently it is estimated that primary health care coverage, defined as village-level access to a health post, has increased from 51 percent in 2000 to 92 percent in 2011.

Despite these increases in the supply of health care and increases in the utilization of some specific services, overall outpatient health care utilization rates remain low. For example, according to the Ethiopian Demographic and Health Surveys (see Table 1) utilization rates for children suffering from diarrhea have risen from 13 to 32 percent and for acute respiratory infection from 16 to 27 percent between 2000 to 2011, however, outpatient health care utilization per capita per year has increased only marginally from 0.27 visits in 2000 to 0.3 visits in 2011 (Table 2). It is unlikely that the limited increase in utilization is due to a decline in morbidity (see Mariam, 2011) and more likely that the gap between availability and utilization is driven by three sets of factors, including, supply-side constraints such as the availability and quality of care, demand-side constraints such as price (direct or indirect - transport costs and the like) or knowledge constraints (so-called suppressed demand) driven by difficulties in understanding disease symptoms and a low perceived need for modern health care. Therefore, the main aim of this paper is to examine the extent of foregone care and to gain an understanding of the factors that are responsible for driving a wedge between availability and utilization.

TABLE 2
Basic health care infrastructure indicators in Ethiopia

Heath indicator	Year		
	2000	2005/06	2011
Number of health posts	833	5,955	15,095
Number of health centers	356	635	2,660
Number of hospitals (public only)	78	86	122
Number of hospital beds (public, private and NGO)	11,689	13,922	.
Physicians (GP + Specialist) to population ratio*	1:48,829	1:35,493	1:53,642
Nurses to population ratio*	1:9,187	1:4,207	1:2,772
Rural health extension workers to population ratio	.	1:8,434	1:5,426
Primary health care coverage in percent	50.71	76.9	92.1
Outpatient care utilization (visits) per capita per year	0.27	0.33	0.30
Total hospital admissions	95,515	327,075	677,934

Notes: * Only includes health professionals working in public health facilities **Source:** 2000, 2005, and 2011 Ethiopian health and health related indicator statistics obtained from the Ethiopian Federal Ministry of Health (FMoH).

The extent and the reasons for foregoing care and who foregoes care are issues that have often been overlooked in health systems research. Available attempts for developed countries typically rely on explicitly asking survey respondents whether they did not use care when needed (see e.g. Mielck et al., 2009; Schoen et al., 2004). For low and middle income countries the evidence is mainly limited to the use and inequity in use of maternity and child care (e.g. Barros et al., 2012). Moreover these papers focus on assessing the extent of foregone care and do not examine the determinants of foregone care. Self-reported information on foregone care is likely to underestimate unmet health needs, in particular in low-income settings where knowledge about medical conditions and the need for care may be limited. For example, data from the Ethiopian World Health Survey, in which respondents were asked whether they received care the last time it was needed, reveals that only 13 percent of respondents in the poorest quintile reported an unmet need for medical care (WHO, 2005). In contrast, 74.4 percent of women in the poorest quintile, interviewed in the 2011 Ethiopian Demographic Health Survey, did not receive any antenatal care during their last pregnancy (CSA and ICF International, 2012).

This underestimate may be driven by two problems. First, poorer households may underestimate the need for health care as they may be less aware of their health problems. Highlighting this concern, Bonfrer et al. (2012) use data from several Demographic and Health Surveys conducted in Africa to show larger socioeconomic inequalities in objective measures of ill-health compared to those in subjective (self-reported) outcomes suggesting that poorer households tend to provide more positive assessments of their health status as compared to richer households. Second, even if poor households are aware and value their health in the same way as richer households, they might still report a lower *need for health care* (suppressed demand) due to insufficient knowledge of the benefits of care, distrust of the health care system and financial and/or other supply side restrictions.

One way to investigate the problem of foregone care is by using the concept of clinical vignettes. The idea is to present survey respondents with well-defined medical cases and ask them about treatment needed. By fixing the medical condition, variation in responses to the vignettes may be attributed only to individual differences in perceptions of the care needed and not due to varying severity in the ill health condition. An example would be to present respondents with the symptoms of acute malaria and ask them "if, where and when" a person experiencing such conditions should seek health care. Investigating the responses to such queries will then yield evidence on the perceived need for care and support an investigation of variations in the need for health care across socioeconomic status, and other attributes of interest such as gender, ethnicity, household demographic composition, geographical location and health care supply.

This approach has been adopted by several studies in high-income countries (Adamson et al., 2003; Chaturvedi et al., 2003; Chavez et al., 2010; Frie et al., 2010) and has revealed that in these countries lower socioeconomic (ethnic or education level) groups are *more* likely to consult a doctor for a given set of symptoms. Thus, the studies conclude that inequalities in actual health care utilization may be attributed to barriers in health care provision and differences in case management due to ethnic origins and not due to difficulties in understanding the symptoms of the disease or due to a lower perception of the need for care (Chaturvedi et al., 2003; Adamson et al., 2003). Despite the potential advantages of using health care vignettes as an alternative technique to analyze health care seeking behavior, this approach has not been widely used in the context of low and middle-income countries where

presumably variations in the perceived need for health care are much greater than in high income countries.[2]

The current study uses a series of context-specific child and adult related clinical vignettes to explore the health care seeking behavior of rural Ethiopian households. The analysis deals with three issues. First, do households seek modern care, second, conditional on seeking modern care where do they seek care and finally the timing of their care-seeking behavior. Based on an assessment of these three issues and variations in responses across vignettes and across socioeconomic status we seek to shed light on who foregoes care and why. Specifically, we seek to assess whether limited health care utilization is driven by difficulties in understanding disease symptoms and/or a low perceived need for modern care (suppressed demand) or is it due to other factors such as the availability, quality and price of care.

The remainder of this paper is organized in the following manner. The next section provides a brief contextual description and discusses recent initiatives in the health sector. This is followed by a discussion of the data and methods. Section IV contains estimates while the final section summarizes and concludes the paper.

2   The Ethiopian health care system – a brief description

Ethiopia's public health care system consists of three-tiers, that is, health posts, health centers and district and zonal hospitals. Each health post, typically staffed by two health extension workers, is expected to serve 5,000 individuals and to provide primary health care services.[3] These services, which pay special attention to maternal and child health, include a package of basic preventive and promotive interventions on issues pertaining to disease prevention and control, environmental hygiene and sanitation, and family health which among others, includes advice on family planning, nutrition and the provision of immunization services. Health posts are expected to attend to cases of normal childbirth, provide curative services to handle conditions such as malaria and diarrhea, and supervise tuberculosis treatment and antiretroviral treatment for HIV/AIDS. While some health posts may have access to antibiotics they are not expected to administer these (see Banteyerga, 2011). In principle, users of health posts do not have to pay for any of the services.

The second level of care is provided by health centers, each of which is supposed to cater to five health posts or 25,000 individuals. Health centers offer both out- and in-patient services (10 beds) as well as basic laboratory and pharmacy services and are expected to be staffed by two health officers, three midwives and five nurses.[4] General hospitals at the district and zonal levels are expected to cater to 250,000 and 1 million individuals, respectively, and offer a wide range of out-patient and in-patient care (a minimum capacity of 50 beds) as well as laboratory, imaging and pharmacy services. Such hospitals are expected to be staffed by a number of general medical practitioners as well as specialized doctors and

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[2] A recent exception is Benziger et al. (2011) - based on a vignette designed to capture acute coronary syndrome (ACS) Benziger et al. (2011) report that women in Peru are less likely to recognize the symptoms of ACS and also less likely to seek health care for chest pain as compared to men.

[3] Typically, health extension workers are 10th grade graduates who have received training for about a year on basic health care provision.

[4] A health officer is expected to have completed a 4 year university course after 12 years of basic and high school.

nurses. In order to use health center (hospital) services users are expected to pay a fee ranging from ETB 1–5 (3–10) for consultations and to pay for medicines (USAID, 2011).

On the supply-side, in recent years, the government has focused on enhancing access to primary health care through the expansion of health centers and especially through health posts. Since 2003, under the aegis of the community-based Health Services Extension Programme (HSEP) there has been a rapid expansion of health posts across all regions of the country (for details see Admassie et al. 2009; Banteyerga, 2011). HSEP was rolled out in a stepwise fashion and was expected to reach full coverage of 1 health post for every 5,000 individuals by 2009-10. While this target may not have been reached, at least at the national level, the availability of health posts is not too far from this mark with one health post for every 5,426 individuals (see Table 3) and primary health care coverage of 92 percent. According to Admassie et al. (2009), HSEP was a "major move from Ethiopia's traditional system of facility-based health care services" as it adopted a preventive and promotive health care approach and required health extension workers to adopt a proactive approach and visit households to provide health education and services rather than waiting for households to come to health posts. To achieve its objectives, health extension workers are expected to spend 75 percent of their time visiting households and to teach by example as well as by identifying and training model families who in turn will diffuse knowledge to other families. The government's HSEP has attracted international attention and has been praised as a cost-effective way of providing universal access to health care (Balabanova et al. 2011).

TABLE 3
Regional distribution of health facilities in 2011

Region	Hospitals		Health center (HC)		Health post (HP)		Primary health care coverage
	N	Hospital-Pop. Ratio	N	HC-Pop. Ratio	N	HP-Pop. Ratio	
Tigray	14	1:340,168	183	1:26,024	552	1:8627	58.0
Amhara	19	1:969,200	724	1:25,435	3,093	1:5954	84.0
Oromia	41	1:742,648	991	1:30,725	6,053	1:5030	99.4
SNNPR	20	1:843,242	513	1:32,875	3,603	1:4681	106.8
National	122	1:671,402	2,660	1:30,794	15,095	1:5426	92.1

Source: Ethiopian health and health related indicator statistics obtained from the Ethiopian Federal Ministry of Health (FMoH).

Despite this impressive expansion, the government's budgetary allocation for health care is well-below the level required to supply adequate health care services. Per capita public health expenditure in 2007-2008 was $2.23, which is considerably lower than the $15.41 per capita required to achieve the health targets of the Millennium Development Goals (MDGs) and the $34 advised by the WHO to provide basic healthcare services in low income countries (Fekade, 2010). In 2009, private health care spending as a percentage of total expenditure on health constituted 52.4 percent. About 80 percent of private health expenditure was in the form of out-of-pocket payment and only 1.5 percent of private healthcare expenditure was covered by private insurance institutions, which is low as compared to other Sub-Saharan African Countries such as Kenya (8.8%), Benin (7.3%) and Senegal (17.9%) (WHO, 2012).

To tackle some of these issues, and as a complement to the heavy investment in the supply of health care, since 2008 the government has been pursuing a number of reforms

related to the financing of health care. Most prominently, in order to increase discretionary resources and to help improve quality, the government has been supporting a policy of revenue retention and utilization at the facility level. By December 2011, 79 percent of health centers and 88 percent of hospitals had implemented the reform and funds raised by these facilities are being ploughed back into the facility. While there are differences across facilities, typically, the first priority is the use of funds to procure drugs. A recent evaluation of the reform provided a positive assessment and noted that "by and large, facilities adhere to the guidelines for retained revenue utilization" (see USAID, 2011).

The revenue retention programme was accompanied by two components (i) setting and revision of user fees and prices charged for drugs and (ii) a cost waiver system for the "poorest of the poor". It appears that these components have not been as successfully implemented. While drug prices are regularly revised, for various reasons, in several regions, a comprehensive revision of user fees, recommended every five years, has not taken place. At the same time the fee waiver system has been patchily implemented. The scheme has been relatively comprehensively implemented in the Amhara region, followed by Oromiya, while in SNNPR only 27 of 157 districts have started implementing the system (USAID, 2011).

The most recent attempt to raise additional resources for health care and to enhance access has been the introduction of a government supported community-based health insurance (CBHI) scheme for the rural population and urban informal sector workers. Since mid-2011, on a pilot basis, a voluntary CBHI scheme has been established in four main regional states (*Amhara, Tigray, Oromiya and SNNPR*). In each region the intervention encompasses three selected districts. Each enrolled household is expected to pay a one-time registration fee of ETB 5 and an annual fee of ETB 180. As of December 2011, 37,766 paying households had been enrolled. Plans to scale-up and offer the CBHI scheme at a national level are currently under discussion.

3   Data and methods

3.1   Data description

This study is based on a household survey which covers the four main regions of the country (*Tigray, Amhara, Oromiya,* and *SNNPR*). From each of these regions, which together account for about 86 percent of the country's population (Population Census Commission, 2008) four districts were selected and within each district a household survey was canvassed in 6 randomly chosen kebeles (peasant associations).[5] In each of the 96 kebeles, 17 households were randomly surveyed yielding a total of 1,632 households comprising 9,455 individuals. The survey was canvassed between March and April 2011(before the roll out of the CBHI scheme) and contains extensive information on a variety of individual and household socio-economic attributes including information on health status, health care utilization and health care seeking behavior. In addition to the household survey, in August 2011, facility surveys designed to assess the availability of medicines and equipment were conducted in 32 health posts (8 in each region) and 48 (12 in each region) health centers.[6]

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[5] In each region the four districts were selected to include both resource-poor, that is, food-insecure districts and relatively better-off districts.

[6] While the facility data are drawn from facilities located in the same district in which the household survey was conducted it is not possible to map the facility data to the household data as the facility

The household survey instrument contains five short clinical vignettes which were developed with input from researchers at Addis Ababa University's School of Public Health. The vignettes are based on illnesses that are widely prevalent in the study region and may be related to acute respiratory infection/pneumonia among babies, diarrhea affecting female infants, adult male experiencing malaria, adult male experiencing tetanus, and an adult female affected by tuberculosis.[7] The vignettes were primarily designed to enable an exploration of heterogeneity in health care seeking behavior for conditions affecting children and adults. For each case respondents were asked what they would do, that is, whether and where they would seek care and when they would seek care in case they or someone in their household were to experience the symptoms described in the vignettes.[8] Respondents were offered a set of 11 choices for health care provider including an option for foregone care (do nothing). Based on the government's service guidelines, diagnosis and treatment for diarrhea and malaria is expected to be available at health posts.[9] Health centers and hospitals are expected to be able to cater to all the illnesses described in the vignettes.[10]

Conditional on their response, respondents were asked when they would seek care and were offered a set of 6 options ranging from immediate to more than a week later. The vignettes were designed with the view that medically the immediate care-seeking option may be considered the appropriate course of action (for details see Appendix A1). The vignettes were read out to respondents by trained enumerators and responses provided by household heads were recorded. Response rates, for where to seek care and when to seek care are high, 99.7 and 97.4 percent respectively.

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survey does not cover all the facilities in a district. Additionally, there are no restrictions in terms of the facility which a household may visit.

[7] According to the WHO's country health profile the most prominent cause of death among Ethiopian children under the age of five is pneumonia which accounts for 21 percent of child deaths. Diarrhea also figures prominently accounting for 14 percent of child deaths. In terms of burden of disease (BOD), diarrhea, respiratory infections, malaria and unintentional injuries are the four most prominent contributors to the country's BOD (see http://www.who.int/gho/countries/eth.pdf - accessed on August 21, 2012).

[8] In the context of anchoring vignettes (e.g. Bago d'Uva et al., 2008) the use of self-referential vignettes is avoided to make the assumption of vignette equivalence (different respondents interpret the same vignette in the same way) more likely. In the present context, vignette equivalence is less likely to be violated because the vignettes are more specific than those typically used to correct for self-assessed health. Furthermore, while testing the survey tool we found that respondents had difficulties responding to vignettes that did not relate to their own household.

[9] Based on a survey of 32 health posts we found that 24 of 32 facilities had medicines to deal with malaria while only 18 of 32 had stocks of oral rehydration salts. Medical equipment, for example, thermometers were available in 15 of 32 posts, stethoscopes in 11 of 32 and sphygmomanometers in 22 of 32 posts. Comparatively, posts in the Amhara region appeared to be the most well-stocked in terms of equipment (6 of 8 had thermometers, 7 of 8 had stethoscopes and all had sphygmomanometers).

[10] Unlike health posts, health centers appear to face limited drug availability problems. In general, only seven of the 48 facilities indicated that they faced drug shortages. However, there are variations in terms of the availability of specific drugs. Pertinent to the current analysis, drugs to treat respiratory infections and malaria were available in all health centers; for gastro-intestinal conditions drugs were unavailable in two health centers and drugs for diseases affecting the central nervous system (tetanus) were unavailable in 20 health centers. While drug availability may be less of a concern, staffing falls short of requirements. While each health center is expected to have two health officers, in 27 of the 48 centers there was only one health officer.

In addition to the vignettes, information on a range of other variables was collected in order to enable an exploration of the associations between health care seeking behavior and other attributes of interest. These include information on household demographic composition, education of the household head, household health status, economic status as captured by per capita household consumption, attitudes towards modern health care, a range of variables to control for access to public (health) infrastructure and finally a set of indicators to control for regional differences. Descriptive statistics for the sample as a whole as well as region-specific descriptive statistics are provided in Table 4.

3.2 Statistical Analysis

The analysis begins by examining responses to the two parts of each vignette, that is, where to seek care and when to seek care. This is followed by an examination of a binary outcome - the probability of seeking (modern) care versus the alternative of other care options.[11] Odds ratios based on logit regressions of the binary outcome as a function of a number of household and village characteristics are provided for each vignette. We also estimate a series of multinomial logit (MNL) models for the type of provider sought in response to each vignette. To enhance the tractability of the empirical work, the 11 options are classified into five options which include seeking care from health posts, health centers, private/NGO clinics, public/private/NGO hospitals and other options. While we follow this five-part classification for all the vignettes an exception is the tuberculosis-related vignette where due to the unlikelihood of getting treatment from a health post for the described symptoms, we re-estimate a MNL model where seeking care from a health post is classified as part of other care options. Conditional on choosing modern care we examine the timing of care-seeking behavior using a set of ordered logit models. The outcome variable consists of five options – seek care immediately, the next day, after two days, between three days to one week, a week or more.

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[11] 'Other care' includes do nothing, traditional healers, religious healers, and visiting a pharmacy/drug store.

TABLE 4
Means of covariates

Characteristics	Region				Total sample	N
	Tigray	Amhara	Oromiya	SNNPR		
Male headed households (1/0)	0.72	0.91	0.91	0.90	0.86	1,632
Age of the household heads (years)	48.01	47.64	44.01	45.25	46.23	1,631
Head's education (1/0)						
No education at all	0.59	0.43	0.46	0.38	0.47	1,631
Informal education	0.08	0.26	0.14	0.03	0.13	1,631
Primary	0.31	0.29	0.36	0.49	0.36	1,631
Secondary or postsecondary	0.01	0.02	0.04	0.10	0.04	1,631
Religion of the head (1/0)						
Orthodox Christian	0.99	0.50	0.49	0.10	0.52	1,632
Protestant	0.00	0.00	0.02	0.76	0.19	1,632
Muslim	0.01	0.50	0.49	0.05	0.26	1,632
Other religion or no religion	0.00	0.00	0.00	0.10	0.03	1,632
HH size (number of persons)	5.17	5.69	5.91	6.40	5.79	1,632
Household composition						
Proportion of children aged under 6	0.15	0.13	0.17	0.14	0.15	1,632
Proportion of males aged 6 to 15	0.15	0.15	0.18	0.16	0.16	1,632
Proportion of females aged 6 to 15	0.14	0.15	0.14	0.16	0.15	1,632
Proportion of males aged 16 to 64	0.22	0.26	0.24	0.26	0.25	1,632
Proportion of females aged 16 to 64	0.26	0.26	0.24	0.25	0.25	1,632
Proportion of elderly aged above 64	0.08	0.05	0.03	0.03	0.05	1,632
Self-assessed health status (SAH)						
Proportion of household members with good SAH	0.70	0.74	0.93	0.79	0.79	1,632
Proportion of household members with fair SAH	0.24	0.22	0.05	0.15	0.17	1,632
Proportion of household members with low SAH	0.05	0.04	0.01	0.06	0.04	1,632
Consumption quintiles (1/0)						
Poorest quintile	0.22	0.15	0.06	0.37	0.20	1,593
2nd quintile	0.26	0.21	0.11	0.22	0.20	1,593
3rd quintile	0.22	0.22	0.21	0.15	0.20	1,593
4th quintile	0.14	0.24	0.29	0.12	0.20	1,593
Richest quintile	0.16	0.17	0.33	0.14	0.20	1,593
Modern care can be trusted (1/0)						
Disagree	0.14	0.05	0.06	0.08	0.08	1,627
Neither agree nor disagree	0.07	0.03	0.09	0.06	0.06	1,627
Agree	0.80	0.92	0.85	0.86	0.85	1,627
Access to public infrastructure						
Water using from public sources (1/0)	0.77	0.57	0.34	0.67	0.59	1,631
Use electricity (1/0)	0.06	0.15	0.02	0.06	0.07	1,626
Use electricity (1/0)	0.06	0.15	0.02	0.06	0.07	1,626
Use electricity (1/0)	0.06	0.15	0.02	0.06	0.07	1,626
No mobile signal (1/0)	0.92	0.73	0.74	0.78	0.79	1,632
Travel time to the nearest health post (in minutes)	34.54	31.2	24.65	21.36	27.81	1,599
Travel time to the nearest health center (in minutes)	74.38	65.65	63.92	54.68	64.66	1,632
Travel time to the nearest public hospital (in minutes)	140.87	116.83	96.31	88.68	110.65	1,631

4   Results

4.1   Whether to seek care

Table 5 provides vignette-specific information on the reported choices. The table reveals a potentially striking pattern – a very small proportion of respondents would forego treatment all together (*do nothing*) with foregone care ranging from 0.6 percent for diarrhea to 2.5 percent for tetanus. Similarly, across all vignettes there is a strong preference for modern care. Only in a small fraction of cases ranging from 2.3 percent for diarrhea and about 4.7 percent for tetanus do households report that they would resort to other options. Given the country's low socio-economic development and low educational stock (see Table 4) this is surprising. A potential explanation may lie in the rapid and recent spread of health posts and health extension workers who since 2003 have been charged with the responsibility of raising awareness of health issues. This interpretation is buttressed by the descriptive statistics provided in Table 4 which show that across the board 85 percent of the sample respondents agree with the statement that modern sources of health care can be trusted.

Nevertheless, surprised by these high rates of modern care uptake in response to hypothetical symptoms we also examined actual outpatient health care seeking behavior. While these two - actual health care seeking behavior without any controls for the particular disease affecting individuals and hypothetical care seeking behavior in response to a

TABLE 5
Responses to the vignettes

	Case vignette[a]				
	ARI/Pneumonia	Diarrhea	Malaria	Tetanus	Tuberculosis
Where to seek care					
Health post	41.17	33.56	21.72	24.80	20.02
Health center	50.00	56.63	62.02	59.05	60.57
Private clinic	4.05	5.64	6.63	6.63	5.96
Mission/NGO clinic	0.25	0.18	0.31	0.18	0.37
Public hospital	1.41	1.47	4.48	4.42	9.95
Private hospital	0.12	0.18	0.18	0.12	0.31
Mission/NGO hospital	0.06	0.06	0.18	0.06	0.00
Pharmacy/drug store	0.25	0.37	0.25	0.37	0.00
Religious healer	0.74	0.31	1.10	0.12	1.11
Traditional healer	0.80	1.04	1.84	1.78	0.68
Do nothing	1.17	0.55	1.47	2.46	1.04
N	1,630	1,630	1,630	1,629	1,628
When to seek care[b]					
Immediately	54.24	45.76	27.67	34.86	21.05
The next day	37.04	39.11	31.47	25.97	25.35
After two days	6.95	11.61	22.72	17.27	17.64
Between three and a week	1.33	2.64	12.42	11.86	12.77
After a week or more than a week	0.44	0.88	5.73	10.05	23.20
N	1,582	1,593	1,554	1,552	1,582

Notes: [a] All figures in the table are in percent. [b] Only for respondents who use modern care (that is, health post, health centers, private clinics, mission/NGO clinics, public hospitals, private hospital, and Mission/NGO hospitals).

description of disease-related symptoms may not be comparable, given the high rate of modern care uptake we felt it was important to examine actual utilization in order to get a sense of the credibility of the vignette instrument. Figures for actual health seeking behavior provided in Table 6 show that foregone care is close to 30 percent as compared to about 1-3 percent on the basis of the vignettes. While this difference may be related to the relatively serious ill health conditions described in the vignettes, the actual utilization figures also show that conditional on facing an illness/injury close to 90 percent of respondents report that they use modern care as opposed to other care options. This figure is quite similar to that obtained from the vignettes suggesting that the overwhelming reliance on modern care as revealed by the vignettes is unlikely to be driven by a lack of understanding of the vignette instrument.[12]

TABLE 6
Outpatient care utilization

	N (%)
Household members reporting illness / injury in the two months preceding the survey (percent of sample)	1,161 (13.53)
Obtained health care conditional on illness / Injury (percent of those reporting illness/injury)	805 (69.58)
Source of care (percent who report conditional on illness / injury)	
Health post	57 (7.42)
Health center	389 (50.65)
Private clinic	142 (18.49)
Mission/NGO clinic	6 (0.78)
Public hospital	69 (8.98)
Private hospital	12 (1.56)
Mission/NGO hospital	7 (0.91)
Pharmacy/drug store	31 (4.04)
Religious healer	4 (0.52)
Traditional healer	23 (2.99)
At home	19 (2.47)
Neighbor's home	2 (0.26)
Other	7 (0.91)

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[12] The consistency between hypothetical and actual behavior reported here is also supported by research done in other contexts. For instance, van der Meer and Mackenbach (1998) show s strong link between a reported tendency to consult a doctor and observed consultation rates. For more on this issue see Frie (2010) and references therein.

TABLE 7
Probability of seeking modern care – Odds ratios based on logit specifications

VARIABLES	ARI / Pneumonia (1)	Diarrhea (2)	Malaria (3)	Tetanus (4)	Tuberculosis (5)
Head sex	1.818	2.078	1.139	1.055	1.288
Head age	0.999	0.976	1.017	0.981	0.982**
Head's education (ref: no education at all)					
Informal education	0.741	0.277**	0.378***	1.274	1.018
Primary	0.883	0.782	1.811*	1.347	0.590***
Secondary or post secondary	3.598	.	.	1.780	0.488**
Household size	1.031	1.100	0.897	1.235**	1.032
HH composition (ref: prop. of male adults aged 16 to 64)					
Prop. of children aged under 6	0.0889	0.0359*	0.290	0.0368***	0.549
Prop. of males aged 6 to 15	0.899	0.262	0.483	0.152*	1.411
Prop. of females aged 6 to 15	0.0330**	1.078	0.946	0.442	1.071
Prop. of females aged 16 to 64	1.300	0.903	0.111*	1.640	0.477
Prop. of elderly aged above 64	0.121	0.132	0.0265***	0.575	0.731
HH health status (ref: Prop. of households with good SAH)					
Prop. of household with fair SAH	2.202	1.916	1.522	1.825	1.116
Prop. of household with low SAH	8.311	6.341	.	7.200	0.566
Consumption quintiles (ref: poorest quintile)					
2nd quintile	2.904*	3.147*	2.198**	1.543	2.310***
3rd quintile	1.575	1.406	1.846	0.997	2.295***
4th quintile	0.784	1.053	3.258**	1.253	3.816***
Richest quintile	0.771	3.117	2.156*	1.004	2.583***
Trust in modern heath care (ref: disagree)					
Agree	1.292	2.181	3.642***	2.588**	0.441***
Neither agree nor disagree	0.606	0.628	0.607	0.366**	0.194***
Access to public infrastructure					
Water using from public sources	0.960	0.952	1.379	1.080	0.970
Use electricity	4.023	2.083	0.835	1.218	2.628***
No TV signal	1.256	2.851**	1.130	0.842	0.655**
No mobile signal	1.090	0.931	1.265	1.288	1.021
Travel time to the nearest health post (in minutes)	1.003	0.990	1.017**	1.009	1.006
Travel time to the nearest health center (in minutes)	1.003	1.009	0.995	0.996	0.993***
Travel time to the nearest public hospital (in minutes)	0.994**	0.992**	0.995**	0.997	1.002*
Religion of the head (ref: Muslim)					
Orthodox Christian	2.498*	0.715	3.603***	1.740	3.517***
Protestant	1.050	0.763	0.636	0.376	4.150***
Other religion or no religion	0.626	0.149*	0.394	0.149*	6.392***
Regions (ref: SNNPR)					
Tigray	3.134	7.000*	0.999	1.239	1.169
Amhara	3.698	7.321**	1.112	0.898	9.946***
Oromiya	2.712	6.226*	1.740	1.876	17.75***
Pseudo R^2	0.154	0.224	0.192	0.165	0.205
N	1,546	1,480	1,480	1,545	1,545

Notes: *** p<0.01, ** p<0.05, * p<0.1. Except for the estimates in the last column, the modern health care option includes health posts, health centers, private clinics, mission/NGO clinics, public hospitals, private hospital, and mission/NGO hospitals and other care option includes do nothing, traditional healers, religious healers, and pharmacies/drug stores. In the case of tuberculosis, health posts are included as part of the other care option. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell. For example, very few individuals with secondary education or a small proportion of households with low SAH status.

To explore patterns in health care seeking behavior across various characteristics we provide estimates of the probability of using modern versus alternative care based on a set of logit models. Table 7 presents estimates for each of the vignettes. Across all socio-economic categories, as captured by the education of the household head and consumption quintiles, health care seeking behavior for the two most common sources of child morbidity and mortality (ARI/pneumonia and diarrhea – columns 1 and 2) do not differ systematically. While there is some variation, in general, children in households with uneducated heads are just as likely to access modern care as those with primary education. Similarly, children in households in the lowest consumption quintiles are just as likely to access modern care as those living in households in the highest quintiles (4th and 5th).

Differences are more pronounced for vignettes related to adults. The effects of education are mixed. In the case of malaria, households headed by more educated individuals are more likely to seek modern care, there is no effect of education in the case of the tetanus vignette and with regard to tuberculosis more educated individuals are more likely to seek the other care option. The effects of economic status are far clearer. In the case of malaria, households in the richer quintiles are 2.1 to 3.3 times more likely to seek modern care as compared to those in the poorest quintile and for tuberculosis households in the richer quintiles are 2.3 to 3.8 times more likely to avoid the other care option.

With regard to the other covariates, except for tuberculosis, the gender and age of the household head does not have a bearing on the health-seeking behavior. Similarly, household size, demographic composition and health status play a limited role. However, the religion of the household head plays a role. In three of the five cases (ARI/pneumonia, malaria and tuberculosis) households headed by orthodox Christians are 2.5 to 3.6 times more likely to seek modern care as compared to Muslim headed households. The regional patterns indicate that for diarrhea and tuberculosis, households in Amhara and Oromiya are far more likely to use modern care as compared to their counterparts in SNNPR. Since access to public health facilities in SNNPR seems to be at least at par or at times better as compared to other regions (see Tables 3 and 4), as discussed above, it is likely that the lower probability of using care in SNNPR may be due to the limited implementation of the fee waiver system in this region as compared to Amhara and Oromiya regions. In addition, based on the facility survey we find that health posts in Amhara region are relatively better resourced as compared to all other regions (see footnote 9).

4.2   Where to seek care

Tables 8A to 8E provide multinomial logit estimates of health-seeking behavior for each of the vignettes. As in the case for the decision to seek modern care, characteristics such as the sex and age of the household head, household size, demographic composition and self-assessed health status do not appear to be systematically related to health-seeking behavior. Accordingly for each vignette we focus mainly on the effects of education and religion of the household heads, consumption and geographical location.

The estimates of the ARI/pneumonia vignette (Table 8A) show that household heads with informal education or higher than secondary education are 1.6 to 1.8 times more likely to take their children to health centers (baseline is health posts) which potentially offer higher quality of care as compared to household heads with no education. Educational status is not systematically related to other sources of health care, and even household heads with no education are unlikely to rely on other care options. Similarly with regard to diarrhea (Table 8B), educational status does not exert much of an influence on care-seeking behavior.

However, in both cases, there is clearer evidence that households in higher consumption quintiles are more likely to access health centers and hospitals as opposed to health posts. The limited role played by education and the more important role played by the household's economic status suggests that differences in health-seeking behavior for child-related conditions may be driven less by household inability to recognize the severity of symptoms but more by lack of resources which may push them to seek lower level care.

With regard to the three vignettes for adults – malaria (Table 8C), tetanus (Table 8D) and tuberculosis (Table 8E) – household consumption appears to play an important role in influencing choice of health care provider. Households in the bottom quintile are far more likely to visit health posts while all other consumption quintiles are more likely to access higher level care. For the malaria vignette, the probability of using care from health centers is 2 times higher and from private or public hospitals is 3 to 9 times more likely for higher consumption quintiles as compared to the poorest quintile. At the same time there is no evidence that households in the lower-most quintile are being pushed to other care options, except for tuberculosis (Table 8E).

The estimates reveal systematic differences in the choice of health care providers across different religions. For both child and adult vignettes, Orthodox Christians and Protestants are more likely to choose higher level care (health centers and private clinics) as compared to Muslims. For instance, in the case of ARI/pneumonia (Table 8A), Christians are about 3.5 times more likely to use health centers and in the case of diarrhea about 4-5 times more likely to use health centers. In the case of tuberculosis, the pattern is similar in the sense that Christians are more likely to seek care in health centers and less likely to use other care options (which includes health posts in this case).[13] Across all vignettes, households living in the Amhara and Oromiya regions are far more likely to seek care from health centers as compared to the SNNPR regions.

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[13] This may not be obvious as in the case of the other vignettes as the baseline category in this case is health centers.

TABLE 8a
Probability of seeking care for ARI/pneumonia– Relative risk ratios, based on multinomial logit specifications

VARIABLES	Health center	Private / NGO clinic	Public / Private / NGO hospital	Other care options
Head sex	1.010	2.237	2.242	0.753
Head age	0.991	1.002	0.995	1.009
Head's education (ref: no education at all)				
Informal education	1.611**	0.927	0.268	0.779
Primary	1.170	0.523*	0.589	0.564
Secondary or post-secondary	1.763*	0.670	1.144	.
Household size	1.066	1.014	1.080	0.962
HH composition (ref: Prop. of male adults aged 16 to 64)				
Prop. of children aged under 6	0.233***	0.294	1.369	20.07
Prop. of males aged 6 to 15	0.740	4.385	3.505	7.392
Prop. of females aged 6 to 15	0.901	2.402	2.369	42.50*
Prop. of females aged 16 to 64	0.539	1.319	0.433	4.519
Prop. of elderly aged above 64	0.996	0.114	0.004	21.21
HH health status (ref: Prop. of households with good SAH)				
Prop. of household with fair SAH	0.752	0.541	0.110	0.499
Prop. of household with low SAH	0.350**	0.151	.	0.0151
Consumption quintiles (ref: poorest quintile)				
2nd quintile	1.443*	1.997	.	0.422
3rd quintile	1.372	1.807	.	0.858
4th quintile	1.442*	1.588	.	1.730
Richest quintile	1.413	3.057**	.	1.188
Trust in modern heath care (ref: disagree)				
Agree	0.626**	0.761	0.251	0.404
Neither agree nor disagree	0.372***	0.842	.	0.984
Access to public infrastructure				
Water using from public sources	1.392**	0.775	0.276**	0.946
Use electricity	4.531***	3.240*	20.34***	0
No TV signal	0.848	0.689	0.777	0.393*
No mobile signal	1.852***	0.652	4.684*	0.787
Travel time to the nearest health post (in minutes)	1.014***	0.997	1.015	1.011
Travel time to the nearest health center (in minutes)	0.990***	1.003	1.004	0.994
Travel time to the nearest public hospital (in minutes)	1.001	0.995*	0.989**	1.010***
Religion of the head (ref: Muslim)				
Orthodox Christian	3.448***	4.334***	12.08***	1.894
Protestant	3.597***	1.121	2.408	1.600
Other religion or no religion	6.223***	6.012**	5.486	1.602
Regions(ref: SNNPR)				
Tigray	0.697	0.0297***	0.116*	0.0701**
Amhara	11.04***	1.106	0.936	0.666
Oromiya	4.365***	0.541	0.426	0.116*
Pseudo R²		0.193		
N		1,527		

Notes: *** p<0.01, ** p<0.05, * p<0.1. The reference outcome is health posts. Other care options include do nothing, traditional healers, religious healers, and pharmacies/drug stores. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell. For example, very few individuals with secondary education opting for the no-care option or very few households with low SAH status seeking care in hospitals.

Probability of seeking care for diarrhea– Relative risk ratios based on multinomial logit specifications

VARIABLES	Health center	Private / NGO clinic	Public / Private / NGO hospital	Other care options
Head sex	0.941	0.964	7.846*	0.959
Head age	0.987*	0.997	0.965	1.018
Head's education (ref: no education at all)				
Informal education	1.302	0.542	0.163	4.330*
Primary	0.832	0.589*	0.445	1.041
Secondary or post-secondary	0.981	0.755	0.705	.
Household size	1.067	1.160*	1.029	0.954
HH composition (ref: Prop. of male adults aged 16 to 64)				
Prop. of children aged under 6	0.265**	0.125*	0.158	6.510
Prop. of males aged 6 to 15	0.801	1.231	0.805	4.784
Prop. of females aged 6 to 15	0.495	0.289	3.139	0.123
Prop. of females aged 16 to 64	0.752	0.571	3.012	3.315
Prop. of elderly aged above 64	0.933	0.0550	0.749	31.33
HH health status (ref: Prop. of households with good SAH)				
Prop. of household with fair SAH	0.818	0.698	0.290	0.516
Prop. of household with low SAH	0.372**	0.0361*	0.143	0.0287
Consumption quintiles (ref: poorest quintile)				
2nd quintile	1.463*	2.077*	7.170*	0.373
3rd quintile	1.656**	1.720	8.574*	1.086
4th quintile	1.423*	1.925	18.82***	2.417
Richest quintile	1.469*	2.178*	11.09**	0.596
Trust in modern heath care (ref: disagree)				
Agree	0.674*	0.995	0.226**	0.216**
Neither agree nor disagree	0.349***	0.991	.	0.902
Access to public infrastructure				
Water using from public sources	1.125	0.816	0.209***	1.509
Use electricity	3.833***	3.085*	39.84***	.
No TV signal	0.719**	0.741	1.641	0.289**
No mobile signal	0.932	0.249***	0.943	0.924
Travel time to the nearest health post (in minutes)	1.016***	1.000	1.005	1.031**
Travel time to the nearest health center (in minutes)	0.992***	1.004	1.008	0.977***
Travel time to the nearest public hospital (in minutes)	1.000	0.989***	0.995	1.014***
Religion of the head (ref: Muslim)				
Orthodox Christian	3.956***	4.112***	7.517***	5.486
Protestant	5.425***	1.252	2.380	6.923
Other religion or no religion	10.73***	4.212*	6.345	.
Regions(ref: SNNPR)				
Tigray	0.871	0.0184***	0.132*	0.0467**
Amhara	10.45***	2.010	1.572	0.715
Oromiya	7.798***	2.274	0.763	.
Pseudo R^2		0.196		
N		1,537		

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The reference outcome is health posts. Other care options include do nothing, traditional healers, religious healers, and pharmacies/drug stores. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell, for example, very few individuals with secondary education opting for the no-care option.

TABLE 8c
Probability of seeking care for malaria – Relative risk ratios based on multinomial logit specifications

VARIABLES	Health center	Private / NGO clinic	Public / Private / NGO hospital	Other care options
Head sex	1.091	1.287	1.929	1.058
Head age	0.988	0.998	0.988	0.956**
Head's education (ref: no education at all)				
Informal education	1.596	1.052	1.589	6.585***
Primary	0.665**	0.476**	0.986	0.288**
Secondary or post-secondary	0.523*	0.333*	0.643	.
Household size	1.062	1.155*	1.069	1.295**
HH composition (ref: Prop. of male adults aged 16 to 64)				
Prop. of children aged under 6	0.590	0.408	0.427	0.402
Prop. of males aged 6 to 15	1.327	2.966	2.085	3.277
Prop. of females aged 6 to 15	1.034	1.572	1.207	1.773
Prop. of females aged 16 to 64	0.847	0.302	0.648	14.45
Prop. of elderly aged above 64	0.708	0.464	3.344	285.3***
HH health status (ref: Prop. of households with good SAH)				
Prop. of household with fair SAH	0.980	1.229	0.487	0.253*
Prop. of household with low SAH	0.557	0.0553*	0.408	0.000648**
Consumption quintiles (ref: poorest quintile)				
2nd quintile	1.968***	3.870***	3.294**	0.828
3rd quintile	2.269***	3.575***	4.878***	0.858
4th quintile	2.748***	4.399***	8.796***	0.959
Richest quintile	2.053***	5.536***	5.246***	1.162
Trust in modern heath care (ref: disagree)				
Agree	0.376***	0.931	0.526	0.0696***
Neither agree nor disagree	0.195***	0.417	0.255	0.169***
Access to public infrastructure				
Water using from public sources	1.079	0.739	0.468**	0.561
Use electricity	3.816***	1.942	6.236***	4.277*
No TV signal	0.436***	0.453**	2.139*	0.368**
No mobile signal	1.348	0.504**	0.453**	1.258
Travel time to the nearest health post (in minutes)	1.012***	0.996	1.002	0.994
Travel time to the nearest health center (in minutes)	0.991***	1.003	0.999	1.001
Travel time to the nearest public hospital (in minutes)	1.002**	0.992***	1.003	1.008**
Religion of the head (ref: Muslim)				
Orthodox Christian	3.693***	2.789***	0.931	0.627
Protestant	7.578***	1.461	0.397	11.20**
Other religion or no religion	14.61***	11.24***	1.213	41.53***
Regions (ref: SNNPR)				
Tigray	1.799	0.118***	0.460	0.640
Amhara	12.56***	3.099**	2.782	5.814
Oromiya	28.05***	8.934***	3.617*	1.532
Pseudo R^2		0.204		
N		1,523		

Notes: *** p<0.01, ** p<0.05, * p<0.1. The reference outcome is health posts. Other care options include do nothing, traditional healers, religious healers, and pharmacies/drug stores. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell, for example, very few individuals with secondary education opting for the no-care option.

TABLE 8d
Probability of seeking care for tetanus – Relative risk ratios based on multinomial logit specifications

VARIABLES	Health center	Private / NGO clinic	Public / Private / NGO hospital	Other care options
Head sex	0.827	1.680	2.203	1.150
Head age	0.990	0.996	1.002	0.987
Head's education (ref: no education at all)				
Informal education	1.145	0.393**	0.572	0.421
Primary	0.763	0.403***	0.736	0.308**
Secondary or post-secondary	0.875	0.209**	0.187	0.539
Household size	1.077*	1.062	1.050	1.051
HH composition (ref: Prop. of male adults aged 16 to 64)				
Prop. of children aged under 6	1.024	1.272	2.063	86.92**
Prop. of males aged 6 to 15	1.928	2.527	2.313	97.80**
Prop. of females aged 6 to 15	0.841	1.195	0.451	4.433
Prop. of females aged 16 to 64	1.069	0.167	1.254	10.78
Prop. of elderly aged above 64	1.304	0.211	2.109	94.98**
HH health status (ref: Prop. of households with good SAH)				
Prop. of household with fair SAH	0.853	1.277	1.036	0.270
Prop. of household with low SAH	0.415*	0.0474*	0.192	0.0242
Consumption quintiles (ref: poorest quintile)				
2nd quintile	1.770***	2.954***	7.405**	1.438
3rd quintile	1.626**	2.515**	11.87***	1.597
4th quintile	2.814***	3.036**	29.04***	3.754**
Richest quintile	1.862**	3.248**	9.416***	4.926**
Trust in modern heath care (ref: disagree)				
Agree	0.377***	2.696	0.952	0.0859***
Neither agree nor disagree	0.291***	0.907	0.435	0.443
Access to public infrastructure				
Water using from public sources	1.025	0.701	0.346***	0.970
Use electricity	2.376***	2.606*	3.880**	0.951
No TV signal	0.548***	0.521**	2.185**	0.615
No mobile signal	1.205	0.405***	0.407**	0.629
Travel time to the nearest health post (in minutes)	1.017***	1.006	1.004	1.003
Travel time to the nearest health center (in minutes)	0.989***	1.003	1.001	1.003
Travel time to the nearest public hospital (in minutes)	1.002**	0.988***	0.998	1.002
Religion of the head (ref: Muslim)				
Orthodox Christian	3.748***	2.362**	0.781	0.314
Protestant	5.123***	1.104	0.281	.
Other religion or no religion	9.581***	4.651*	0.936	.
Regions (ref: SNNPR)				
Tigray	1.498	0.0804***	0.570	.
Amhara	8.687***	2.218	1.333	.
Oromiya	23.97***	9.438***	3.782*	.
Pseudo R^2		0.210		
N		1,507		

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The reference outcome is health posts. Other care options include do nothing, traditional healers, religious healers, and pharmacies/drug stores. A '.' indicates that the relevant ratio could not be computed due to limited information in the relevant cell, for example, very few Protestant head of households opting for the no-care option.

Probability of seeking care for tuberculosis – Relative risk ratios based on multinomial logit specifications

VARIABLES	Private / NGO clinic	Public / Private / NGO hospital	Other care options
Head sex	2.385	1.510	0.832
Head age	1.008	0.999	1.018**
Head's education (ref: no education at all)			
Informal education	0.549	1.232	0.962
Primary	0.743	0.908	1.639***
Secondary or post-secondary	0.407	0.760	1.828
Household size	0.959	1.001	0.969
HH composition (ref: Prop. of male adults aged 16 to 64)			
Prop. of children aged under 6	0.269	3.349	1.842
Prop. of males aged 6 to 15	1.389	2.129	0.772
Prop. of females aged 6 to 15	0.821	1.979	0.960
Prop. of females aged 16 to 64	0.219	2.972	2.156
Prop. of elderly aged above 64	0.155	4.116	1.515
HH health status (ref: Prop. of households with good SAH)			
Prop. of household with fair SAH	1.406	1.118	0.917
Prop. of household with low SAH	0.0311*	0.359	1.468
Consumption quintiles (ref: poorest quintile)			
2nd quintile	1.351	1.805	0.459***
3rd quintile	1.165	2.203*	0.472***
4th quintile	0.855	3.414***	0.293***
Richest quintile	1.338	2.987**	0.440***
Trust in modern heath care (ref: disagree)			
Agree	3.602**	1.222	2.442***
Neither agree nor disagree	2.524	0.587	4.947***
Access to public infrastructure			
Water using from public sources	0.675	0.553***	0.940
Use electricity	0.948	1.469	0.404**
No TV signal	1.045	1.271	1.573**
No mobile signal	0.384***	0.753	0.842
Travel time to the nearest health post (in minutes)	0.988*	0.997	0.993*
Travel time to the nearest health center (in minutes)	1.010***	1.002	1.008***
Travel time to the nearest public hospital (in minutes)	0.989***	0.997	0.997**
Religion of the head (ref: Muslim)			
Orthodox Christian	0.520**	0.152***	0.198***
Protestant	0.184***	0.0884***	0.132***
Other religion or no religion	0.424	0.364	0.111***
Regions(ref: SNNPR)			
Tigray	0.0782***	0.808	0.653
Amhara	0.216***	0.578	0.0740***
Oromiya	0.324**	0.369	0.0404***
Pseudo R²		0.183	
N		1,545	

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The reference outcome is health centers. Other care options include do nothing, traditional healers, religious healers, pharmacies/drug stores and health posts.

4.3   When to seek care

While the responses to the vignettes suggest that foregone care is quite limited in the Ethiopian context it is possible that households respond to symptoms with a time lag. In the case of all five vignettes the appropriate reaction in response to the symptoms described is immediate medical attention.

Table 5 displays the distribution of the time lag between the onset of symptoms and the action of respondents. For both the child-related vignettes the reaction of respondents is swift and 91 percent report that they would seek care immediately or the next day in the case of ARI/pneumonia while the corresponding figure for diarrhea is 85 percent. For the other cases the response is slower and ranges from an immediate/next day response rate of 46 percent for tuberculosis to 59-60 percent for malaria and tetanus. For tuberculosis the reaction time is quite slow with about a quarter of respondents indicating that they would wait for a week or more after the onset of symptoms. The sharp differences in reaction times across the two sets of vignettes may be attributed to a greater concern for children as opposed to adults or perhaps more likely and consistent with the expansion of the health extension program, due to greater knowledge of the symptoms and markers of child-related diseases.

Odds ratios based on a set of vignette specific ordered logit estimates are provided in Table 9. To aid interpretation, note that the dependent variable is increasing in time to seek care. Age and sex of the household head and demographic composition of the household do not influence the timing of care-seeking. However, across the various cases, educational attainment seems to play a stronger role in influencing timing of care as opposed to choice of health care provider. For instance, in the case of tuberculosis, household heads with informal education are 1.6 times more likely to delay seeking immediate care as opposed to those with secondary education. Similarly, for diarrhea, malaria, and tetanus vignettes, the estimates show that household heads with primary or secondary education are systematically more likely to seek care immediately as opposed to their less educated counterparts. The effects of household economic status as captured by consumption quintiles indicate that households in richer quintiles are more likely to seek care immediately. For instance in the case of ARI/pneumonia households in the two highest quintiles are 33 (1 – 0.67) to 38 (1 – 0.62) percent more likely to seek care immediately as compared to households in lower consumption quintiles. Similar patterns prevail for malaria and tetanus although not for diarrhea and tuberculosis.

The link between religion of the household head and the time of health care seeking behavior varies across vignettes. For the case of child symptoms (ARI/pneumonia and diarrhea), Orthodox Christians are more likely to delay care than Muslims while the reverse is true for the adult-vignettes (malaria, tetanus, and tuberculosis). Regional differences continue to remain pronounced. Almost, across all the vignettes households living in the Amhara and Tigray region display a greater propensity to seek care immediately as compared to households living in SNNPR. Differences are particularly pronounced in the case of the Amahra region where households are at least 75 percent (1 – 0.25 in the case of tetanus) more likely to seek care immediately as opposed to households living in SNNPR.

TABLE 9
When to seek modern care – Odds ratios based on ordered logit specifications

VARIABLES	ARI / Pneumonia	Diarrhea	Malaria	Tetanus	Tuberculosis
Head sex	1.329	0.899	1.354*	1.282	0.993
Head age	1.006	1.008	0.993	0.998	1.004
Head's education (ref: no education at all)					
Informal education	1.019	0.913	0.944	0.810	1.601***
Primary	0.806	0.656***	0.669***	0.796*	1.052
Secondary or post-secondary	0.368***	0.622*	0.403***	0.788	0.502**
Household size	0.979	0.993	0.917***	0.902***	0.953
HH composition (ref: Prop. of male adults aged 16 to 64)					
Prop. of children aged under 6	1.087	0.862	0.711	1.091	3.187**
Prop. of males aged 6 to 15	1.209	0.838	0.806	1.277	1.313
Prop. of females aged 6 to 15	1.005	0.980	1.862	1.619	7.202***
Prop. of females aged 16 to 64	1.324	1.047	1.092	1.281	1.287
Prop. of elderly aged above 64	1.049	0.763	1.088	1.099	1.836
HH health status (ref: Prop. of household with good SAH)					
Prop. of household with fair SAH	0.828	0.719*	1.605***	1.103	1.056
Prop. of household with poor SAH	2.495**	2.493**	2.269**	1.603	2.363*
Consumption quintiles (ref: poorest quintile)					
2nd quintile	0.940	0.839	1.077	0.988	0.952
3rd quintile	0.824	0.931	0.849	0.647***	0.949
4th quintile	0.673**	0.858	0.567***	0.523***	0.852
Richest quintile	0.622**	1.011	0.645**	0.483***	1.040
Trust in modern heath care (ref: disagree)					
Agree	1.533**	1.496**	0.824	0.827	1.742***
Neither agree nor disagree	1.763**	1.198	0.442***	0.594**	0.832
Access to public infrastructure					
Water using from public sources	0.755**	1.019	0.762**	0.797**	0.909
Use electricity	0.626*	0.626**	1.117	0.679*	0.965
No TV signal	0.701**	0.478***	0.487***	0.545***	0.456***
No mobile signal	1.131	0.904	1.189	1.206	2.074***
Travel time to the nearest health post (in minutes)	0.994**	0.992***	0.994**	1.005**	1.000
Travel time to the nearest health center (in minutes)	0.997**	1.002	1.002	1.000	1.000
Travel time to the nearest public hospital (in minutes)	1.004***	1.001	1.003***	1.002**	1.004***
Religion of the head (ref: Muslim)					
Orthodox Christian	2.146***	1.287*	0.768*	0.676***	0.428***
Protestant	1.412	1.259	1.249	0.870	0.846
Other religion or no religion	2.846**	1.536	3.572***	1.865	1.617
Regions (ref: SNNPR)					
Tigray	0.393***	0.780	0.722	0.546**	0.508*
Amhara	0.143***	0.211***	0.241***	0.250***	0.144***
Oromiya	0.519**	1.108	1.819**	1.265	1.089
Pseudo R^2	0.087	0.066	0.067	0.053	0.091
N	1,502	1,518	1,475	1,477	1,192

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Except for the estimates in the last column, the modern health care option includes health posts, health centers, private clinics, mission/NGO clinics, public hospitals, private hospital, and mission/NGO hospitals. In the case of tuberculosis, health posts are not included as part of the modern care option.

4.4   Differences in health care seeking behavior across vignettes

Although differences in health care seeking behavior across the different vignettes is already apparent, in order to provide a clearer comparative sense of these differences we reshaped the data and estimated models for whether, where and when to seek care conditioning on the clinical vignette by including a set of four indicator variables with ARI/Pneumonia as the reference case. The specifications also contain the set of covariates described in Table 4.

     The various estimates provided in Table 10 highlight the differences in the type of care and the timing of care for child-related diseases as compared to adult-related conditions. Households appear to be far more willing to seek modern care for ARI/pneumonia and diarrhea as compared to malaria and tetanus. For both malaria and tetanus, households are about 40 percent less likely to seek modern care as compared to ARI/pneumonia. Another notable pattern pertains to the timing of care. Once more there is a clear difference between child and adult related conditions with households about 4 to 9 times more likely to delay seeking immediate care as opposed to ARI/pneumonia. The difference as compared to diarrhea is somewhat less (about 2 to 8 times) but still substantial. Estimates of the type of health care sought also show that households are more likely to seek care from higher levels of the health care system for adult-related conditions with households substantially more likely to opt for treatment from health centers and hospitals for malaria, tetanus and especially for tuberculosis. The differences in health-care seeking behavior may be due to a greater parental/household concern for children or, as is consistent with our knowledge of the context and recent developments introduced in the Ethiopian health care system, due to the widespread dissemination of information and knowledge and the appropriate course of action for child-related diseases.

TABLE 10
Health care seeking behavior across vignettes[a]

VARIABLES	Probability of seeking modern care [b]	Health center	Private / NGO clinic	Public / Private / NGO hospital	Other care options [e]	When to seek care [d]
	(1)	(2)	(3)	(4)	(5)	(6)
Case vignette (reference ARI/pneumonia)						
Diarrhea	1.500**	1.041	1.538***	1.913***	1.411**	1.457***
Malaria	0.607***	4.101***	3.002***	4.056***	7.858***	4.191***
Tetanus	0.616***	2.355***	2.402***	3.405***	6.496***	3.811***
Tuberculosis	1.072	2.266***	3.280***	4.233***	21.01***	9.211***
Pseudo R^2	0.142		0.186			0.098
N	7,728		7,622			7,472

The header row above lists "Where to seek care [c]" spanning columns Health center, Private / NGO clinic, Public / Private / NGO hospital, Other care options.

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Standard errors have been adjusted for clustering at the level of the respondent. [a] All regressions in the table control for individual and household characteristics, access to public infrastructure and regional dummies. [b] Logit, odds ratios. [c] Multinomial logit, reference outcome is health post, table contains relative risk ratios. [d] Ordered logit, odds ratios. [e] Other care options include do nothing,

5   Concluding remarks

Ethiopia has invested substantially in its health care infrastructure in the last decade through the expansion of health posts and health centers. Despite these investments, utilization of maternal and child care and more general outpatient utilization rates remain among the lowest in Sub-Saharan Africa. The gap between availability and utilization is likely to be

driven by three sets of factors, including, supply-side constraints such as the availability and quality of care, demand-side constraints such as price or knowledge constraints (so-called suppressed demand) driven by difficulties in understanding disease symptoms and a low perceived need for modern health care. To gain an understanding of the factors responsible for driving a wedge between availability and utilization this paper relied on five context-relevant clinical vignettes for common child (ARI/pneumonia and diarrhea) and adult (malaria, tetanus and tuberculosis) conditions to probe whether households seek modern care, where they seek care and the timing of care-seeking behavior.

The estimates suggest that the large majority of respondents recognize the severity of the symptoms described in the vignettes and prefer modern over traditional care and self-treatment. This is especially the case for child related conditions and might be related to the health education campaigns that have taken place in recent years in the context of the Health Extension Program. Indeed, the uniformity of health care seeking behavior for child morbidity displayed across consumption quintiles suggests that information on health education and the appropriate course of action for the most common childhood diseases, which is the focus of the health extension program, seems to have percolated to the lowest socio-economic quintiles.

For adult related conditions, we do find variations across socioeconomic status with households in the highest consumption quintile two to three times more likely to seek modern care as compared to households in the lowest quintiles. These socioeconomic inequalities are also found in the choice of health care provider, and the timing of seeking care. Households in the lowest consumption quintiles are generally more likely to resort to lower level care and postpone seeking care compared to better off households. Taking the example of tuberculosis, which can only be properly treated in health centers and hospitals, we find that households in the upper consumption quintile are three times more likely to seek care in a hospital compared to those in the poorest. We also find variation in the timing of care seeking behavior with respondents typically acting faster for child related conditions as compared to adult conditions.

There are some limitations to this paper. While the use of clinical vignettes allows us to establish patterns of health care seeking behavior across population groups that are not driven by differences in health status, there is the risk that reported hypothetical health care seeking behavior does not match actual health care seeking behavior. However, the overwhelming reliance on modern care found in the actual utilization data does suggest that results from the vignettes analysis are able to capture preferences and are not merely a result lack of understanding of the survey instrument. Second, while we have detailed information on individual and household (demand side) characteristics, we do not have information on health care supply, apart from the distance to health care facilities, which can be linked to the household data. The importance of the regional fixed effects in all the models suggests that variations in implementation of the fee waiver system and regional differences in quality of care are important and need to be considered.

Notwithstanding these limitations, based on the empirical evidence assembled in the paper we tend to conclude that the low utilization rates in Ethiopia are unlikely to be linked to lack of awareness of the symptoms of the most common diseases or a low-perceived need for health care but are more likely to be related to the quality and cost of available care. With regard to the latter, the scaling-up of the recently introduced community-based health insurance schemes may play an important role in reducing socioeconomic inequalities in access to health care.

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Appendices

Appendix Table 1: Clinical Vignettes

1. **Vignette 1: A 3 month old baby, who has always been healthy and playful, has been coughing quite a lot in the last few days and is breathing rapidly. The baby has difficulty sleeping because of this cough.**

    1a. What would you do? (**code 1**) *[If 11 go to 1c]*

    1b. When would you take the baby to this facility? (**code 2**)

    [if 1 or 2 go to question 2a]

2. **Vignette 2: A 1 year old girl, generally in good health, has diarrhea for 3 days now. She is still drinking some fluids, but since this morning, she's feeling sleepy and doesn't want to play.**

    2a. What would you do? (**code 1**) [If 11 go to 3]

    2b. When would you take the girl to this facility? (**code 2**)

3. **Vignette 3: A 20 year old male has always been healthy. For the last week, he has episodes of sudden coldness followed by rigor and then fever and sweating. These episodes occur about every two days. In between episodes he can still do some light housework.**

    3a. What would you do? (**code 1**) [If 11 go to 4]

    3b. When would you go to this facility? (**code 2**)

4. **Vignette 4: A 25 year old male has got a small cut in his leg when working on the field three days ago.
The wound has become red and from time to time he feels a throbbing pain in his leg, but he can still walk around and do some work.**

    4a. What would you do? (**code 1**) [If 11 go to 5]

    4b. When would you go to this facility? (**code 2**)

5. **Vignette 5: A 35 year old female has been coughing for three weeks now. She feels more tired than usual but can still do some housework. Her relatives think she looks thinner than a few weeks ago.**

    5a. What would you do? (**code 1**)

    5b. When would you go to this facility? (**code 2**)

Code 1

1=go to Health post

2=go to Health center

3=go to Private clinic

4=go to Mission/NGO clinic

5=go to Public hospital

6=go to Private hospital

7=go to Mission/NGO hospital

8=go to Pharmacy/drug store

9=go to religious healer

10= go to traditional healer

11=do nothing

Code 2

1=immediately

2=the next day if symptoms continue

3=after two days if symptoms continue

4=between three days and a week if symptoms continue

5=after a week if symptoms continue

6=after more than a week if symptoms continue